

ABSTRACT

A method and system is provided for registering a 2D radiographic image of a target with previously generated 3D scan data of the target. A reconstructed 2D image is generated from the 3D scan data. The radiographic 2D image is registered with the reconstructed 2D images to determine the values of in-plane transformation parameters (x, y, θ) and out-of-plane rotational parameters (r, ϕ) , where the parameters represent the difference in the position of the target in the radiographic image, as compared to the 2D reconstructed image. An initial estimate for the in-plane transformation parameters is made by a 3D multi-level matching process, using the sum-of-square differences similarity measure. Based on these estimated parameters, an initial 1-D search is performed for the out-of-plane rotation parameters (r, ϕ) , using a pattern intensity similarity measure. The in-plane parameters (x, y, θ) and the out-of-plane parameters (r, ϕ) are iteratively refined, until a desired accuracy is reached.